PLANT PROTECTION BULLETIN

A Publication of the
WORLD REPORTING SERVICE ON PLANT DISEASES AND PESTS

VOL. VI, No. 5 FEBRUARY 1958

CONTENTS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ROME

FAO PLANT PROTECTION BULLETIN

is issued as a medium for the dissemination of information received by the World Reporting Service on Plant Diseases and Pests, established in accordance with the provisions of the International Plant Protection Convention, 1951. It publishes reports on the occurrence, outbreak and control of pests and diseases of plants and plant products of economic significance and related topics, with special reference to current information. No responsibility is assumed by FAO for opinions and viewpoints expressed in the Bulletin.

Manuscripts for publication, or correspondence regarding the World Reporting Service, should be addressed to Dr. Lee Ling, Plant Production Branch, Agriculture Division, FAO, Viale delle Terme di Caracalla, Rome, Italy; subscriptions and other business correspondence to the Distribution and Sales Section, FAO, Viale delle Terme di Caracalla, Rome, Italy.

The Bulletin is issued monthly in English, French, and Spanish, and twelve numbers, commencing with the October issue in each year, constitute a volume. Subscription rates are $ 3.00 or 15s. per annum; single numbers are priced at $ 0.30 or 1s. 6d. The citation is FAO Plant Protection Bulletin, or, in abbreviation, FAO Plant Prot. Bull.

MAN AND HUNGER

This pamphlet is mainly intended for teachers in secondary schools. It is hoped that it will help stimulate teachers' interest in the world problem of food and the work of the Food and Agriculture Organization. It is also hoped that it will supply teachers with useful data for the presentation of these subjects in the classroom. FAO, like the United Nations and the other Specialized Agencies, is becoming increasingly convinced that the public understanding necessary for the accomplishment of its tasks must start in the schools. This pamphlet, issued in co-operation with Unesco, is an outcome of that understanding. Criticisms, comments and suggestions are welcomed from all users: $0.25 or 1s.3d.

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The first issue in the same series *Nutrition and Society*, consisting of a lecture given by the late Professor André Mayer of France to inaugurate a course for nutrition workers at Marseilles in late 1955, a short biography of Professor Mayer and an account of FAO's work in the nutrition field, is still available from FAO Sales Agents or from Headquarters. $0.25 or 1s.3d.

FAO Plant Protection Bulletin

Vol. VI, No. 5 A Publication of the February 1958

World Reporting Service on Plant Diseases and Pests

Some Insect Pests of Pistachio in Syria

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In Syria, pistachio (*Pistacia vera*) trees are cultivated mainly in the north around Aleppo and small plantings also exist in the area of Damascus. It is estimated that in the entire country 600,000 trees are grown on approximately 2,500 hectares. A large proportion of the nuts produced are consumed locally.

Pistachio is a small deciduous tree that grows well in soils of low humus content. It prefers light deep soils because of its long tap roots and grows well without irrigation under steppe or desert climate, provided its water requirements can be obtained from the deep subsoil. Usually there are no other crops grown in pistachio orchards. Since pistachio is a dioecious tree, it is important to have male trees in sufficient quantity and properly distributed in isolated plantings.

The pistachio and related species were probably at one time part of the natural flora in Syria but only small areas of these uncultivated trees remain today. After its introduction into cultivation, the pistachio tree continued to retain a rich insect fauna. In addition to several gall-forming but harmless aphids which were recently studied by Davatchi (2), there are also more than 20 known insect species which regularly or occasionally damage the pistachio tree. In the plantation of Ain et Tine, northeast of Damascus, with its several-hundred-year-old trees, there occur some characteristic insect species such as pistachio silkworm (*Pachypasa otus* Drury), and pistachio moth (*Schneidereria pistaciella* Weber), which prefer old trees.

Where trees grow under adverse conditions which hinder the formation of tap roots, pistachio borer (*Capnodis cariosa* Pall.) causes severe damage and the dying trees provide a favorable medium for the mass propagation of the bark beetle (*Chaetophorus vestitus* Muls.). These factors should be taken into consideration for effective control by means of appropriate cultural methods or other measures.

On most plantations the possibility of using sprays for the control of pistachio pests is limited, due to lack of water. Where insecticides are applied, it is recommended that they be used carefully. Davatchi (2) reported that an application of DDT for the control of the jassid *Idiocerus stali* Fieb. was followed by a severe outbreak of *Eurytoma plotnikovi* Nik. which attacked the fruit, the scale *Lepidosaphes pistaciae* Arch. and the psyllid *Agonoscena targionii* Licht.

Pistachio Borer

The pistachio borer (*Capnodis cariosa*) is known as a pistachio pest throughout the Near East, including Iran, the southwest of the U.S.S.R., Turkey, Syria and Israel. Davatchi (2), in describing the imago and larva of this insect, referred to it as a subspecies of *Capnodis cariosa hauseri* O.B.,

[1] The writer served in 1955 as an FAO entomologist in Syria under the FAO Expanded Technical Assistance Program, and had the opportunity to study fruit tree pests in that country. He wishes to express his appreciation for the collaboration received from the staff of the Ministry of Agriculture in Damascus and Aleppo, and to extend his gratitude to Mr. G. A. Davatchi of the Ministry of Agriculture of Iran for review of his manuscript on pistachio pests in Iran.

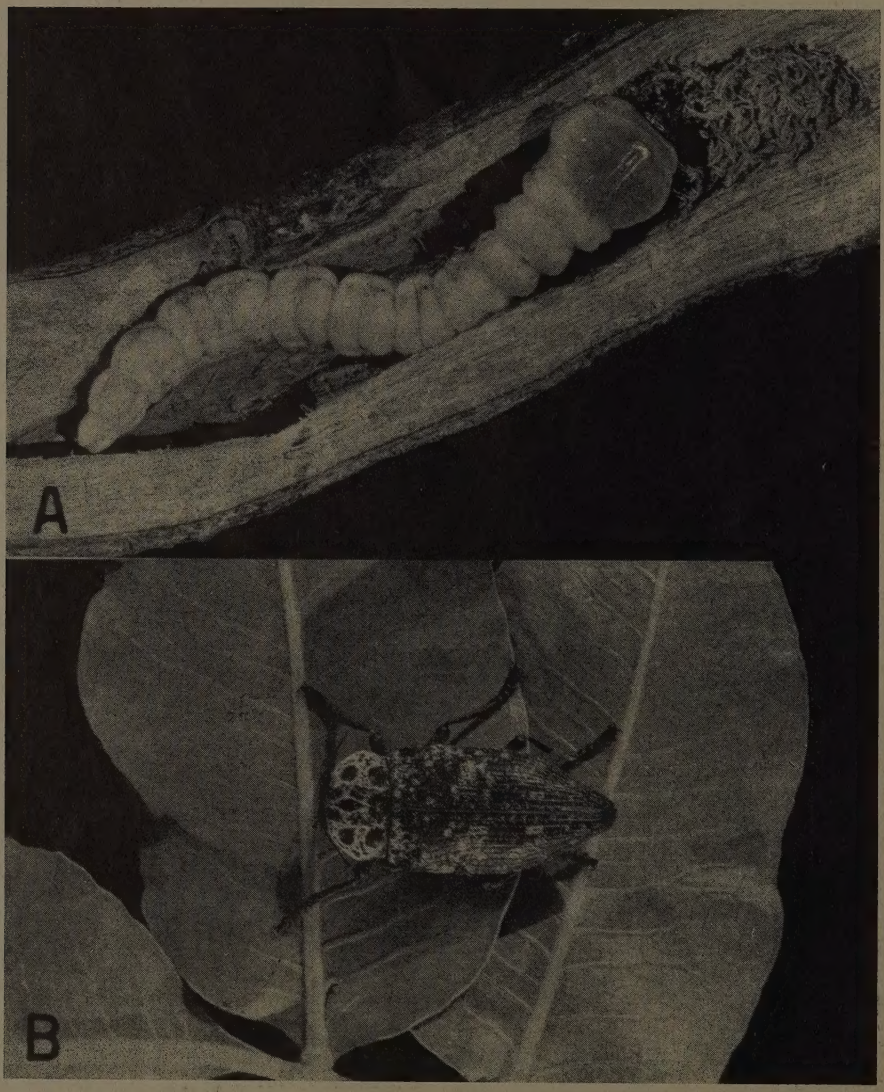

Figure 1. Capnodis cariosa. A. A fully grown larva in pistachio root. B. An adult on pistachio leaf.

and the biology and chemical control of *Capnodis* species were further investigated by Rivnay (5, 6).

In some plantings east of Aleppo, many trees are destroyed each year by this pest. The larva that grows up to 8 centimeters in length, bores into the roots (Figure 1 A). During summer or autumn, affected trees show reduced growth and eventually die, as injured roots fail to absorb sufficient water and food, but dried leaves remain attached to the tree for a long time. Four or five larvae may kill a young tree. In infested plantings, young replanted trees may be attacked a few years subsequent to planting. The loss of trees due to this pest results in a heterogeneous planting with trees of all ages.

On trees growing in deep soil, *Capnodis cariosa* causes little or no damage. In an outbreak area east of Aleppo (Figure 2), the soil layer has often been found to be only 40 centimeters deep; it is stony and lies on compact calcareous rock. Under the foregoing soil conditions the development of tap roots is handicapped and therefore water supply during summer is deficient. It appears that weakened trees which have developed only lateral roots are particularly susceptible to attack and provide favorable conditions for the development of the pest; young trees succumb easily. In extreme cases, it would be preferable not to plant pistachio trees rather than resort to expensive and unreliable chemical control methods.

Chemical control is difficult, as larvae are well protected inside the roots and the generations overlap. During summer, adults (Figure 1 B) may be found on the trees and larvae of all stages in the roots. In Syria, little is known about the control of this pest. It would be prudent to uproot withered trees during spring and summer and to burn the infested roots. In addition, spraying the foliage with DDT or dieldrin should be tried when adults are numerous, in order to reduce oviposition. Probably two or three applications during the growing period would be necessary for satisfactory results.

Pistachio Bark Beetle

The distribution of the pistachio bark beetle (*Chaetophorus vestitus*) corresponds approximately to that of pistachio tree, extend-

Figure 2. Pistachio trees in a planting near Aleppo severely attacked by *Capnodis cariosa*, probably due to the weakened tree growth in shallow and poor soil.

ing throughout Iran, Turkey, Syria, Israel, North Africa, southern Italy and southern France. The morphology and biology of this insect were reported by Russo (7), but the life cycle described by him under conditions prevailing in Sicily may not be exactly the same as that in Syria.

The bark beetle is widespread in the area of Aleppo and around Damascus in Syria, where it has only one generation a year and oversummers as imagoes in dormancy. While it causes severe damage to sound trees, its propagation depends on the presence of dying or dead trees. The beetles fly out at the end of the winter and lay eggs on dying trees or branches. In neglected plantings or plantings that have suffered from *Capnodis* attacks, the bark beetle finds plentiful breeding places. They bore under the bark of a stem or a main branch and deposit eggs on both sides of the main gallery. The galleries of the larvae are perpendicular to the gallery made by the adult. On heavily attacked trees the wood below the cambial layer is destroyed to such an extent that the bark can easily be removed (Figure 3). After the emergence of adults the bark is perforated with holes of 1.5 millimeters in diameter.

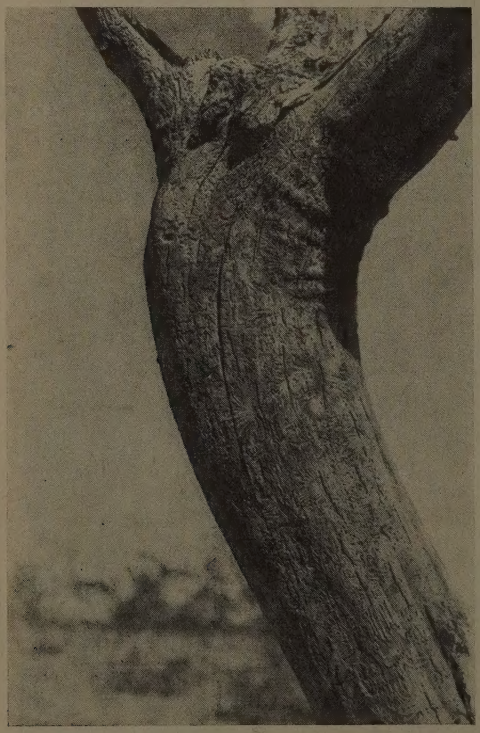

Figure 3. A dead pistachio tree infested by pistachio bark beetle (*Chaetophorus vestitus*), bark being removed to expose insect galleries.

Figure 4. Terminal and flower buds of pistachio attacked by pistachio bark borer (*Chaetophorus vestitus*).

Adults of the new generation take flight at the end of spring to surrounding healthy trees, and male and female beetles bore a short gallery into the terminal or floral bud, where they rest during summer and winter (Figure 4). The heavy damage that the beetle causes to the tree becomes apparent only in the following year when the flower and fruit formation is reduced. A loss of 30 percent of the buds is common. New growth is also reduced and small branches break easily. The galleries also provide an entrance for secondary parasites.

The intensity of attack on a tree depends on the distance of the tree from the breeding place (Figure 5). The beetles invade all the surrounding trees but prefer to fly in a direction opposite to the prevailing wind from the northwest. With increasing distance from the breeding place, the number of infested buds decreases rapidly. It was observed that on trees 35 meters northwest of a tree destroyed by the beetles, more than 30 percent of the buds were attacked; at 50 meters more than 10 percent, and at 80 meters only over 2 percent. The presence of a dead tree invaded by the bark beetle in an orchard usually results in heavy losses.

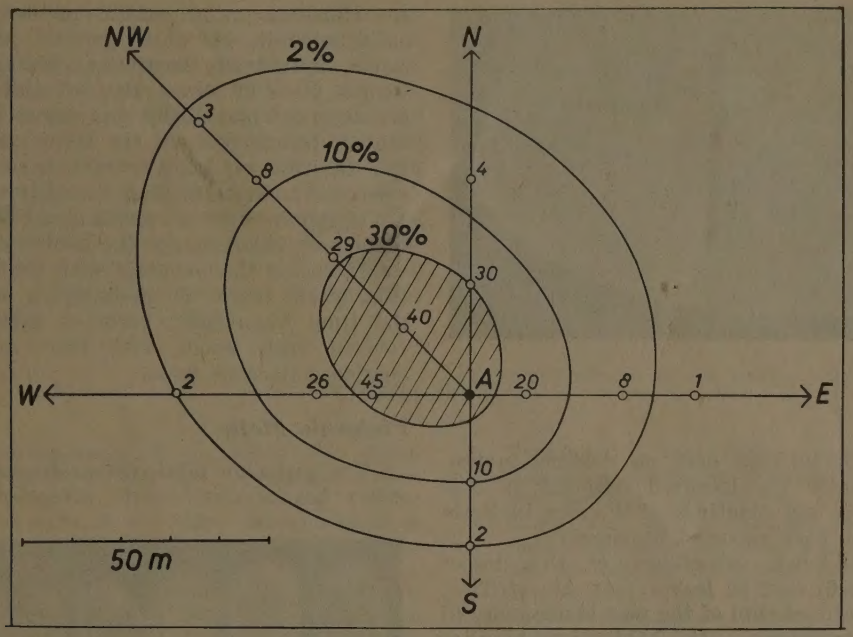

Figure 5. Diagram showing the pattern of spread of pistachio bark beetle (*Chaetophorus vestitus*) from an infested dead tree (A). The newly infested trees examined are indicated by small circles with figures showing the percentages of buds attacked. The infestation spread asymetrically, more intensive and extensive on the northwestern side of the dead tree.

On the bark of a dead tree an average of about 100 exit holes were found per 100 square centimeters. A tree with a stem of 40 centimeter circumference has a bark surface of approximately 1.5 square meters exposed to attack and can harbor about 15,000 beetles. If each emerging beetle is assumed to cause a loss of 12 pistachio nuts, a neglected dead infested tree may result in the loss of 180 kilograms of dried nuts, which represented in 1955 a value of about 700 Syrian pounds, in addition to the damage caused to leaves and tree growth.

On leaving the buds the beetles seem to be attracted to dying trees. Only in exceptional cases are eggs laid in young branches and knowledge of this fact provides a basis for devising an efficient control method which farmers can carry out without incurring additional expense. A few dying trees should be left during autumn and winter in the orchard as bait trees until oviposition is over and larvae have hatched; then they should be burned or the bark removed. Removal of such trees, especially those which show the characteristic entrance holes, should effectively reduce the beetle population and render chemical control unnecessary. This method should give satisfactory results, particularly if it is effected over a large area.

The pistachio bark beetle should not be confused with the small bark beetle *Carphoborus perrsi* Chap., which is apparently of no economic importance. The entrance hole made by *C. perrsi* is only 0.8 millimeter in diameter and therefore trees attacked by either one of the species can be readily distinguished.

Pistachio Silkworm

According to Bodenheimer (1) the pistachio silkworm (*Pachypasa otus*) occurs in Israel on oak, cypress and thuja. Talhouk (9) listed it as a forest insect in Lebanon, affecting oak and wild pistachio species. Davatchi (2)

Figure 6. Young larva of pistachio silkworm (Pachypasa otus).

found it in Iran only on *Pistacia mutica*. Apparently the localized outbreak of this insect in old plantings of *P. vera* in Syria had not been reported previously.

The hairy caterpillars of this insect (Figure 6) feed on leaves. At Ain et Tine, systematic control of the pest is necessary in the plantations. Its habits are peculiar and it seems to favor old gnarled trees. During September the large spheric eggs are found in bark fissures or stem cavities. Larvae hatch the same year, feed on leaves and overwinter in deep stem cavities (Figure 7). In spring, they resume feeding on young leaves and may cause severe leaf losses as they grow. Larvae feed at night and gather in stem cavities during the day, sometimes in large numbers. There is an old time-consuming control method based on this habit, by which farmers pick the larvae individually from their hiding place with a piece of wire. Better results could probably be obtained by spraying or dusting contact insecticides on the stems and into the cavities of knotty trees in autumn, when larvae start feeding. Such treatment would require only a small amount of insecticide and little time, as the habits of larvae would ensure their contact with the insecticide. This insect is probably a relic of the time when most parts of Syria were covered with woods with large areas of gnarled foliaceous trees.

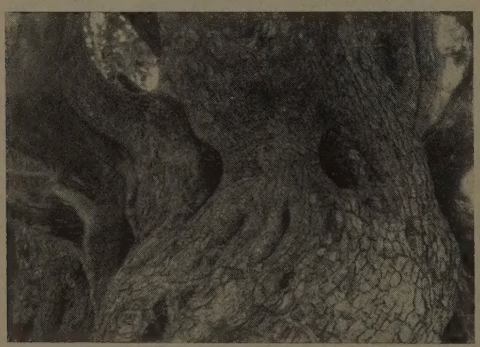

Figure 7. A stem of a very old pistachio tree in Ain et Tine, Syria, with deep cavities where larvae of pistachio silkworm (Pachypasa otus) hide in daytime and during the winter.

Pistachio Moth

The pistachio moth (*Schneidereria pistaciella*) has received little attention until recently. Weber (10) gave a precise description of the genus and species in comparison with related genera, as well as some information on its biology. Gerasimov and Kreuzberg (3) and Davatchi (2) described, under the name of *Recurvaria pistaciicola* Danilevsky, the morphology and biology of probably the same pistachio pest in U.S.S.R. and Iran. Should it be established from the original description of Danilevsky, which has not been accessible to the writer, that the two names refer to the same insect, the valid name should be *Schneidereria pistaciicola* (Danil.).

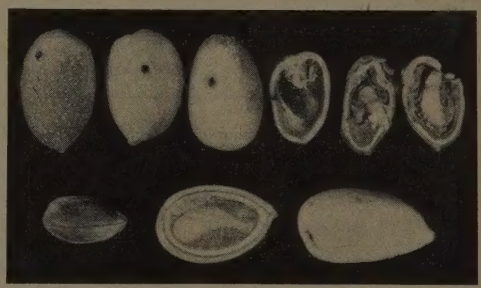

Figure 8. Pistachio nuts attacked by pistachio moth (Schneidereria pistaciella). Normal nuts in lower row.

Larvae of this species penetrate into half-ripe nuts and destroy the kernel. Nuts which suffer a late attack and still hang on trees at harvest time are characterized by

a lateral exit hole of 1.4 millimeters in diameter (Figure 8). The severest attack was observed in the old Ain et Tine plantation, with 30 percent or more of the nuts remaining on the tree being damaged. By mid-September all the larvae had deserted the nuts and bored into the old torn bark of the upper part of the stem, where they overwinter in groups in white cocoons. The larvae are light green or light red in color, measuring approximately 6 millimeters in length. Apparently this moth has only one generation a year in Syria.

It seems worth while to test some control methods in heavily infested plantings. Bark scales on stems and main branches of old trees should be removed and burned during winter; it is difficult for larvae to find an overwintering site on stems with a smooth clean bark. Timely and repeated spraying of fruits just after the main oviposition period, or the application of highly concentrated persistent contact insecticides to stems before larvae desert the nuts, should give satisfactory results.

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The Position of Khapra Beetle in Australia

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In recent years the khapra beetle (*Trogoderma granarium* Everts) has extended its range to include parts of the United States of America and East Africa. Authorities have been involved in heavy expenditure in attempts to eradicate the pest, and quarantine regulations have been passed to prevent its further spread. Recent statements concerning the range of the species include the Australasian region as an area where it is established, although it will be shown that there is no sound basis for this belief. Thus, Zanzibar in Plant Protection (Compulsory Fumigation of Imports) Order, 1956, at first included Australia in the list of areas from which untreated foodstuffs and certain other commodities were prohibited. More recently Shepherd (5) stated that the insect was established in Australia. However, Howe and Lindgren (4) considered that it was not present in Australia.

The opinion that *Trogoderma granarium* occurs in Australia may be based on a single record quoted by Hinton in *A Monograph of the Beetles Associated with Stored Products* (3). In this Hinton refers to a remark by Durrant (2): "I may remark that larval remains in wheat samples from Queensland were, in my opinion, *Trogoderma khapra*, but whether established there or only infesting the ship I am unable to say." It is interesting to note that Durrant himself does not accept this as a record and does not include Australia in his distribution list.

More recently the genus has been studied by Armstrong (1), who has collected over a wide area of Australia and now lists 30 species but has not found *Trogoderma granarium*. Moreover, the author himself has been anxious to obtain khapra beetle for experimental work and has examined cereals in all mainland states and groundnuts in Queensland without finding a single specimen. Furthermore, the insect is unknown to those engaged in the industries concerned.

In 1952, the British Ministry of Agriculture found khapra beetle in two shipments of bagged oats and one shipment of bulk wheat from Victoria, and one shipment of bulk barley from South Australia. In the first three only one or two insects were found in the course of a prolonged inspection of the cargo on arrival in the United Kingdom, but in the barley shipment moderate numbers of adults and larvae were found. They were, however, restricted to only one hold out of a full cargo. It was known, from the previous history of the ship, that two years had elapsed since the vessel had carried a cargo likely to be infested with khapra beetle. The vessel did, however, bunker at West Africa, a known center of infestation, before loading the barley.

Advice concerning these four occurrences was cabled to Australia and immediate examinations were carried out in South Australia and Victoria but no trace of the beetle or its larvae could be found. The following year two instances were reported. In the first of these a cargo of wheat from western Australia was found to have very few khapra beetles on arrival in the United Kingdom. As the previous history of the ship was unknown, the chances of cross-infestation in the hold could not be evaluated. In the second instance a very few adults and larvae were found in a cargo of barley from Queensland. The ship had carried only general cargo for the previous year. However, the identification of the insect was not confirmed.

In 1956, one adult khapra beetle was found in barley from South Australia when it was discharged in the United Kingdom. Two years previously the ship was known to have carried, from another country, a cargo infested with *Trogoderma granarium*. In the same year moderate numbers of khapra were found on a consignment of Australian flour but the authorities of the United Kingdom were of the opinion that

the insects had been acquired during the voyage from grain residues in the hold. This vessel was known to have twice carried in the preceding 12 months Asian grain infested with the species.

The only other available record (undated) is a single occurrence in Tasmania on a cargo of barley from South Australia.

It is possible that some regions of Australia may be suitable for the establishment of *Trogoderma granarium* and, in view of the volume of trade with India and other Asian countries where the insect is known to be endemic, its presence in Australia might be expected. However, in spite of this, the insect does not appear to have become established and all suspected occurrences have been associated with shipping.

Khapra beetle is such a troublesome pest to commerce and industry that an infestation, when established, quickly attracts attention. Nevertheless, apart from the single record from Tasmania, the insect had never been found within Australia. As all other reports have been based on findings in Australian produce after a long voyage and as recent searches within this country have revealed no traces of the insect, there is no valid reason for the belief that khapra beetle occurs in Australia.

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Scaptocoris talpa on Roots of Banana and Other Plants in Honduras

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In the late stages of destruction of a banana plantation by the banana wilt organism, *Fusarium oxysporum* f. *cubense* (E.F.S.) Sny. and Hans., clumps of plants referred to as "islands" remain in production for a considerable time. During examination of the profile of the root system of the banana plant of variety Gros Michel, growing on one of such "islands," it was noticed that the roots were heavily infested with heteropterous insects. Some of the insects were firmly attached with their rostrums to the fibrous and fleshy adventitious roots (Figure 1) and were found at depths from 4 to 44 inches.

On examination of adjacent experimental cover crop plots, it was found that the same insects were feeding on the roots of sorghum plants (*Sorghum vulgare*) variety Tracy, left standing after plowing. Three months later, after working the soil and exposing it to the sun and replanting the crop, only a few insects were observed. Some insects were also found on the roots of young plants of *Xanthosoma roseum* Schott., a common weed locally known as quiscamote.

In a survey of the area around La Lima the same insects were found feeding on the roots of the following plants: *Sida rhombifolia* L., *Panicum laxum* Sw., *P. faciculatum* Sw. and *Pennisetum purpureum* Schum. However, when the above-mentioned plants were growing adjacent to a banana plant with their roots intermingled, the insects were found on banana roots. This insect was identified as *Scaptocoris talpa* Champ., which has been reported from Guatemala as a sugar cane pest and on the roots of *Panicum maximum* Jacq. It is of interest to note that in Honduras, in the vicinity of La Lima, *S. talpa* was not found on the roots of sugar cane plants nor on the roots of banana plants growing in flood-fallowed areas.

Scaptocoris talpa, a member of the family Cydnidae of Heteroptera, was described in 1900 by Champion,[2] and the following information

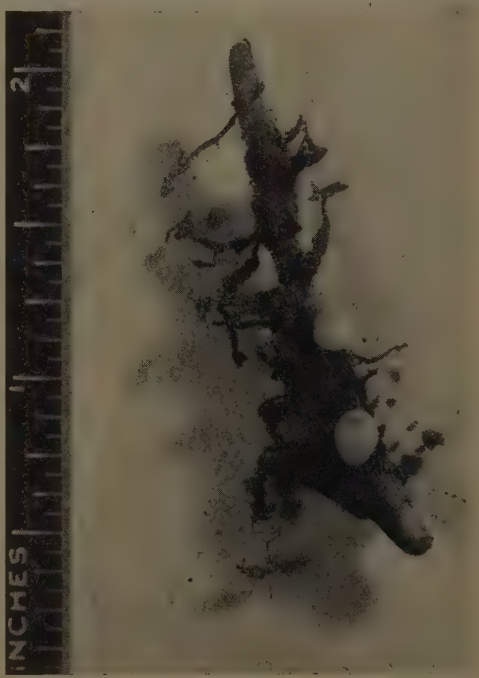

Figure 1. Nymphs of *Scaptocoris talpa* feeding on banana roots.

[1] The author wishes to express his appreciation to Dr. W. R. Richards, Department of Agriculture, Canada, for identification of the insects.

[2] CHAMPION, G. C. 1900. A species of *Scaptocoris* Perty, found at the roots of sugar cane. *Entomologists Monthly Mag.*, Ser. 2. *11*: 255-257.

Figure 2. Adults of *Scaptocoris talpa*. x 3.

Figure 3. Nymphs of *Scaptocoris talpa* at various stages of development. x 3.

may stimulate an interest in this insect. The adult insects are light brown, measuring 6 to 7 millimeters in length and 4 to 5 millimeters in width. Their outstanding morphological features are as follows: the eyes are bright pink; the anterior legs are modified for burrowing, the tibiae being large claws (falciform); the tibiae of the posterior legs are adapted for pushing (Figure 2), reminiscent of an elephant's foot.

The details of their life history are unknown and sexes are indistinguishable by external characteristics. Both sexes in the adult stage have wings but flight was never observed. The insects were found in several stages of development (Figure 3) in the soil. The eggs were not found under natural conditions. However, one female produced two eggs in the laboratory. The eggs were oblong, translucently white to slightly smoky, equally round at both ends and measured 1.65-1.75 × 1.19-1.25 millimeters; they did not hatch.

Adults and nymphs are provided with scent glands which emit a very repugnant odor. Therefore, if the insects are present in the soil one can smell them on excavation. The effect of the volatile matter emitted by these insects on the growth of soil fungi was investigated and the results will be published elsewhere.

Scaptocoris talpa was described originally from specimens collected around Capetillo, Guatemala. Bianchi,[3] 34 years later, on a survey of sugar cane pests in Guatemala, found this insect in the vicinity of Escuintla. Both locations lie in the same region of the west coast of Guatemala. Therefore, as far as the author is aware, this is the first report of this insect in Honduras and also the first report of banana, quiscamote, sorghum, *Panicum laxum*, *P. faciculatum*, *Pennisetum purpureum* and *Sida rhombifolia* as additional hosts of *S. talpa*.

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Outbreaks and New Records

United States

Economic Insect Survey Section
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture

Current Grasshopper Situation

Surveys in the fall of 1957 showed more than 18.5 million acres of rangelands infested with adult grasshoppers (Acrididae) in 17 western and midwestern states. This compares with about 22 million acres infested in the fall of 1956. Heaviest infestations were in Montana, Wyoming, southern Colorado and northwestern Texas. The surveys also showed that populations on croplands were generally lighter than those indicated for the 1957 year. During the 1957 control season insecticides were applied on over 1.5 million acres of rangeland.

Eradication of Imported Fire Ant

The imported fire ant (*Solenopsis saevissima richteri* Forel), an annoying and destructive pest, was introduced into the United States prior to 1920, presumably in the vicinity of Mobile, Alabama. By December 1957, it was known to be present in 171 counties in 9 southeastern states. During the year the Congress of the United States appropriated almost 2.5 million dollars for use in an eradication program against the pest, in co-operation with the infested states, some of which have also appropriated funds for the eradication effort. Insecticide applications were begun on 35,000 acres in Decatur County, Georgia, in October, and in outlying infested areas in South Carolina and Louisiana. To facilitate the eradication work, quarantine measures are being formulated and surveys are being intensified.

Plant Quarantine Announcements

Territory of Papua and New Guinea

A notice under the title of *Prohibited Imports* was made under the authority of Quarantine Ordinance 1953 on 22 November 1953 and was published in *Papua and New Guinea Gazette* No. 60 of 28 November 1957. In accordance with the new notice, the importation of the plants (including all parts of plants unless otherwise mentioned) enumerated below, is prohibited or restricted.

Imports Prohibited

1. Banana (*Musa* spp.) plant, except seed imported under specific conditions.
2. Barberry (*Berberis* spp., *Mahoberberis* spp., *Mahonia* spp.) plant.
3. Cacao (*Theobroma cacao*) plant.
4. Coconuts (*Cocos nucifera*) plant, except seed coconuts imported under specific conditions.
5. Coffee (*Coffea* spp.) plant, except seed for planting which may be imported under specific conditions, and roasted coffee beans for consumption.
6. Cotton (*Gossypium* spp.) plant, except seed from Australia under specific conditions and processed fiber.
7. Dahlia (*Dahlia* spp.) plant, except seed surface-sterilized with silver nitrate.
8. Fruit and vegetables, including all parts of plants and fruits, other than those specifically mentioned in the notice. Fresh fruits and vegetables for consumption may be imported from Australia.
9. Grass, hay, straw and chaff, except when used as packing materials, clean and free from impurities.
10. Lucerne (*Medicago sativa*) plant, except dried lucerne for fodder and seed from Australia under specific conditions.
11. Maize (*Zea mays*) plant, except seed from Australia.
12. Passionfruit (*Passiflora* spp.) plant, except seed imported under permit.
13. Peanut (*Arachis hypogaea*) plant, except seed from Australia.
14. Pepper (*Piper nigrum*) plant (including all parts other than the manufactured product), except planting material which may be imported under permit.
15. Potato (*Solanum tuberosum*) plant, except seed potatoes grown in Australia.
16. Rice (*Oryza* spp.) plant (including rice straw packing), except milled rice for consumption.
17. Rubber (*Hevea brasiliensis*) plant, except under specific conditions.
18. Sunflower (*Helianthus* spp.) plant, except seed from Australia.
19. Sweet potato (*Ipomea batatas*) plant.
20. Tapioca (*Manihot utilissima*) plant.
21. Taro (*Colocasia* spp., *Xanthosoma* spp., *Alocasia* spp.) plant.
22. Tobacco (*Nicotiana* spp.) plant, except seed surface-sterilized with silver nitrate and so certified, leaf for manufacture and manufactured leaf.
23. Yam (*Dioscorea* spp.) plant, except seed imported under permit.
24. Soil, sand, clay and earth, whether by itself, attaching to plants or other goods or as packing or ballast for vehicle.

Imports Prohibited Except from Australia

1. Avocado (*Persea gratissima*) plant.
2. Citrus (all members of subfamilies Aurantioides, Rutoideae and Toddalioideae of Rutaceae) plant. Material imported from Australia must be free from diseases and pests.
3. Cotton seed, importation of which from Australia is permitted if accompanied by a certificate that the seed is free from diseases and pests and originates from certified stock of the Queensland Cotton Board.
4. Eucalyptus (*Eucalyptus* spp.) plant.
5. Gladioli (*Gladiolus* spp.) plant and corms. Corms imported from Australia must be clean and free from soil, pests and diseases, and accompanied by a certificate stating that they have been treated with acid mercuric chloride.
6. Grape (*Vitis* spp.) plant. If capable of propagation, the material imported from Australia must be certified free from *Phylloxera*.
7. Hop (*Humulus* spp.) plant, except commercial hop product for brewing.
8. Lucerne seed, which may be imported from Australia, if certified free from dodder seed.
9. Maize seed.
10. Mango (*Mangifera indica*) plant.
11. Peanut seed, which may be imported under permit from Australia.
12. Seed potatoes.

13. Strawberry (*Fragaria* spp.) plant, which may be imported under permit from Australia, if certified free from diseases and pests.
14. Sugar cane (*Saccharum* spp.) plant, which may be imported from Australia if certified free from diseases and pests.
15. Sunflower seed.
16. Tung (*Aleurites* spp.) plant.
17. Apple plant, pear plant, plants of stone fruits (*Prunus* spp.) and berries (*Rubus* spp.). If capable of propagation, the material imported from Australia should be certified free from crown gall (*Erwinia tumefaciens*).
18. Vegetable seeds not specifically mentioned in the notice. Importation is permitted if the seed has been grown in Australia or a Territory of the Commonwealth and packed by a commercial seed firm.
19. Ornamental plants referred to as bulbs belonging to Liliaecae, Amaryllidaceae and Iridaceae.
20. Cereals (barley, oats, rye, sorghum, wheat), including all parts of the plant.
21. Lucerne and cereal hay for fodder. Such material from Australia must be accompanied by a certificate stating that the fodder was grown in an area free from cattle tick (*Boophilus microplus*) or it was fumigated with methyl bromide or carbon disulphide in a prescribed manner; that the fodder has been found on inspection to be of good quality and substantially free from weed or foreign matter; and that the fodder has been transported in such a manner as to avoid infestation by cattle tick.
22. Fresh fruits and vegetables for consumption. Those from Australia must be free from diseases and pests including injurious fruit fly (Tripetidae).

Imports Restricted

The following plants and parts thereof may be imported only if the requirements specified have been fulfilled.

1. Bamboo (*Bambusae*) plants or planting material may be imported under permit issued by the Chief Quarantine Officer and require a certificate of the country of origin indicating freedom from bamboo smut (*Ustilago schiraiana*) and are subject to post-entry quarantine.
2. Banana seed may be imported under permit; it must be accompanied by a certificate stating that it is free from fruit pulp and has been surface-sterilized and will be grown under quarantine.
3. Seed coconuts are subject to treatment by a prescribed method prior to landing.
4. Coffee seed for planting may be imported under permit; it must be accompanied by a certificate stating that the country of origin is free from rust (*Hemileia vastatrix*. *H. coffeicola*) or berry borer (*Stephanoderes hampei*), and is subject to be grown under quarantine. Unroasted coffee beans for consumption may be ordered to be roasted prior to release.
5. Dahlia seed must be surface-sterilized with silver nitrate.
6. Hibiscus (*Hibiscus* spp.) plant may be imported under permit, subject to quarantine surveillance.
7. Passion-fruit seed may be imported under permit, subject to being grown under quarantine.
8. Pepper (*Piper nigrum*) planting material may be imported under permit, subject to being grown under quarantine.
9. Pineapple (*Ananas* spp.) plant, parts thereof or fruit may be imported under permit. Permit is not required for such materials from Australia.
10. Rubber seed budwood from approved suppliers within the South East Asia and Pacific region may be imported under permit, requiring a certificate indicating freedom from *Dothidella ulei* in the entire country of origin, and freedom from *Oidium heveae* in the plantation of origin. Rubber plants or parts of plants from countries outside the South East Asia and Pacific region may be imported only under such special conditions as determined by the Chief Quarantine Officer. (Detailed regulations are given in a notice under the title of *Prohibition of Importations* of 22 November 1957, which will be summarized in the next issue of this Bulletin.)
11. Tobacco seed must be accompanied by a certificate stating that it has been surface-sterilized with silver nitrate.
12. Yam seed may be imported under permit, subject to quarantine surveillance.
13. Grass, hay, straw, chaff as packing material. Clean cereal straw or straw chaff may be imported if free from all plant or other impurities including weeds. Straw packing from any country other than Australia and New Zealand must be kept in bond for 90 days, or it has been in transportation for 90 days before the date of landing. Otherwise, it must be

accompanied by a certificate from the principal veterinary officer in the country of origin indicating freedom from foot and mouth disease in that country during the five years preceding shipment, or a certificate certifying that it has been treated with live steam in a closed compartment, at 185° F. for at least 15 minutes. Any goods containing packing material shall be repacked and the packing material destroyed if the above-mentioned conditions have not been complied with.

United Kingdom (England and Wales)

The Importation of Potatoes Order 1957, which came into operation on 25 December 1957, modifies, for the period from 25 December 1957 to 31 May 1958, the restrictions imposed by the Importation of Plants Order 1955 (see *FAO Plant. Protc. Bull. 3* : 60. 1955) on the importation of potatoes from Belgium, France or the Netherlands. Potatoes grown in 1957 in those three countries may be imported during the specified period, provided that:

1. they have been grown in a district where an intensive system of control of Colorado beetle (*Leptinotarsa decemlineata*) is in operation;
2. they have been riddled in a packing station, inspected and approved by the phytopathological service of the country of origin, the riddling being subject to inspection, and are free from soil and Colorado beetle infestation; and
3. they have been securely packed, immediately after riddling, in new bags with the label of the packing station attached.

News and Notes

Plant Protection Committee for South East Asia and the Pacific

The second meeting of the Plant Protection Committee for the South East Asia and Pacific Region was held in Kandy, Ceylon, 2-7 December 1957, and attended by representatives of 12 governments and the South Pacific Commission. Reports made by government representatives with regard to recent plant quarantine activities in their respective territories indicate that the provisions of the regional Plant Protection Agreement and the recommendations of the previous sessions of the committee have been widely implemented, especially in relation to measures for the prevention of the introduction of South American leaf blight (*Dothidella ulei*).

Appendix A of the Plant Protection Agreement, which contains a list of destructive pests and diseases not yet established in the region but requiring particular attention in quarantine enforcement, was reconsidered by the committee and further modified in accordance with current knowledge on the distribution of important pests and diseases. Recommendations were made on measures needed for regulating the importation and movement of crops of regional importance. Among these, it was recommended that bud wood and other propagating material of hevea rubber moving within the region should be dusted with sulphur before shipment and dipped in a mercuric chloride solution for a brief period immediately before use to eliminate *Odidium heveae*, because of the possibility of physiologic races of the organism existing or developing in different areas of the region.

The committee further stressed the risk involved in the dissemination of destructive pests and diseases by plant materials moving in international air traffic and suggested that, in addition to appropriate legislative control, a campaign for public education on this matter should be launched in each country.

Regional Plant Protection Organizations

As many problems in the field of plant protection can be most effectively dealt with through

regional co-operation, FAO has been encouraging and assisting Member Governments in the establishment of regional plant protection organizations. The International Plant Protection Convention in its Article VIII stresses the need for such regional organizations.

At present there are regional organizations operating in four different geographic areas. The European and Mediterranean Plant Protection Organization, established in 1951, gives special attention to the combatting of Colorado beetle potato root eelworm, San José scale, potato wart, fall webworm, and pests of stored products and, it has made significant progress in establishing uniform plant quarantine measures. The Organismo Internacional Regional de Sanidad Agropecuaria, operating in Central America, Panama and Mexico, covers the protection of both plants and animals and, insofar as plants are concerned, it centers its efforts on the migratory locust, the newly introduced Mediterranean fruit fly and quarantine problems. The other two organisms, the Inter-African Phytosanitary Commission and the Plant Protection Committee for the South East Asia and Pacific Region, are primarily concerned with preventing the introduction and spread of destructive plant diseases and pests.

Pertinent information concerning these regional plant protection organizations is as follows:

European and Mediterranean Plant Protection Organization (EPPO)

Participating Governments: Algeria, Austria, Belgium, Denmark, Federal Republic of Germany, France, Greece, Guernsey, Ireland, Israel, Italy, Jersey, Luxembourg, Norway, Netherlands, Portugal, Spain, Sweden, Switzerland, Tunisia, United Kingdom, U.S.S.R., Yugoslavia.

Year of Establishment: 1950.
Address: 142, avenue des Champs-Elysées, Paris, France.
Director-General: V. E. Wilkins.

Inter-African Phytosanitary Commission

Participating Governments: Belgium, France, Federation of Rhodesia and Nyasaland, Portugal, Union of South Africa, United Kingdom.

Year of Establishment: 1956.
Address: c/o Commonwealth Institute of Entomology, 56 Queen's Gate, London, S. W. 7, United Kingdom.
Scientific Secretary: J. Risbec.

Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA)

Participating Governments: Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.

Year of Establishment: 1955.
Address: Apartado 434, Managua, D. N., Nicaragua.
Executive Director: J. A. Torres.

Plant Protection Committee for the South East Asia and Pacific Region

Participating Governments: Australia, Ceylon, Federation of Malaya, France, India, Netherlands, Pakistan, Portugal, Thailand, United Kingdom, Viet Nam.

Year of Establishment: 1956
Address: c/o FAO Regional Office, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand.
Chairman: T. H. Harrison.

Roma - Tip. del Senato del dott. Giovanni Bardi

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